

WHAT IS CLAIMED IS:

1. A data driving apparatus for driving an organic electro luminescence display (OELD) panel, comprising:

5 a data driver that outputs data signals formed using a substantially uniform current; and

a data signal controller circuit connected to the data driver for charging a substantially uniform current corresponding to the outputted data signals and for applying the outputted charged current corresponding to the outputted data signals, wherein light is
10 emittable by the OELD panel in the presence of the applied current.

2. The data driving apparatus according to claim 1, further comprising:

a scan driver for applying scan signals to the OELD panel; and

a timing controller for controlling the scan driver and the data driver.

15 3. The data driving apparatus according to claim 2, wherein the OELD panel includes pixel cells formed at crossings of gate lines and data lines, wherein each pixel cell includes an electro luminescence cell and a cell driver, wherein the cell driver includes:

20 a first switching device formed between a cell drive voltage source and the electro luminescence cell for driving the electro luminescence cell;

a second switching device connected to the cell drive voltage source to form a current mirror with the first switching device;

25 a third switching device connected to the second switching device, a gate electrode line, and a data line, wherein the third switching device is responsive to data signals outputted by the data driver;

a fourth switching device connected to gate terminals of the second and third switching devices, a data line, and the third switching device; and

30 a storage capacitor connected between gate terminals of the first and second switching devices and the cell drive voltage source.

4. The data driving apparatus according to claim 2, wherein the OELD panel includes pixel cells formed at crossings of gate lines and data lines, wherein each pixel cell includes an electro luminescence cell and a cell driver, wherein the cell driver includes:

a first switching device formed between a cell drive voltage source and the electro

luminescence cell for driving the electro luminescence cell;

a second switching device connected to the first switching device, a gate electrode line, and a data line, wherein the second switching device is responsive to data signals outputted by the data driver; and

5 a storage capacitor connected between gate terminals of the first and second switching devices and the cell drive voltage source.

5. The data driving apparatus according to claim 1, further comprising a plurality of data lines coupled between the data signal controller circuit and the OLED panel.

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6. The data driving apparatus according to claim 5, wherein the data signal controller circuit includes a plurality of constant current supply switching devices having gate terminals connected to a cell drive voltage source for applying the substantially uniform current to the data lines.

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7. The data driving apparatus according to claim 6, wherein the data signal controller circuit includes:

a first data signal controller circuit for storing a voltage corresponding to the data signals outputted by the data driver during application of a first scan signal;

20 a second data signal controller circuit for storing a voltage corresponding to a data signal outputted from the first data signal controller circuit and for applying the stored voltage to the data lines between application of the first scan signal and a subsequent application of a second scan signal;

25 a first switch connected between the data driver and the first data signal controller circuit for providing a current path between the data driver and the first data signal controller circuit; and

a second switch connected between the first data signal controller circuit and the second data signal controller circuit for providing a current path between the first data signal controller circuit and the second data signal controller circuit.

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8. The data driving apparatus according to claim 7, wherein the data signal controller circuit further includes a drive signal supplier for driving the first and second data signal controller circuit.

9. The data driving apparatus according to claim 8, wherein the drive signal supplier includes:

a shift register for driving the first data signal controller circuit and the first switch
5 during application of the first scan signal; and

a line pass controller for driving the second data signal controller circuit and the second switch between application of the first scan signal and application of the second scan signal.

10 10. The data driving apparatus according to claim 9, wherein the first data signal controller circuit includes:

a fifth switching device connected between the cell drive voltage source and the second switch;

a first capacitor connected between a gate terminal of the fifth switching device and
15 the cell drive voltage source; and

a third switch connected between the gate terminal of the fifth switching device and the second switch, wherein the third switch is controllable by the shift register.

11. The data driving apparatus according to claim 10, wherein the second data
20 signal controller circuit includes:

a sixth switching device connected between the second switch and a ground voltage source;

a second capacitor connected between a gate terminal of the sixth switching device and the ground voltage source; and

25 a fourth switch connected between the gate terminal of the sixth switching device and the second switch, wherein the fourth switch is controllable by the line pass controller.

12. The data driving apparatus according to claim 9, wherein the first switch is controllable by the shift register.

30 13. The data driving apparatus according to claim 9, wherein the second switch is controllable by the line pass controller.

14. The data driving apparatus according to claim 11, wherein at least one of the switching devices is provided as a p-type metal oxide semiconductor field effect transistor (MOSFET).

5 15. The data driving apparatus according to claim 11, wherein at least one of the switching devices is provided as an n-type metal oxide semiconductor field effect transistor (MOSFET).

10 16. A method of driving an organic electro luminescence display (OELD) panel having pixel cells arranged at crossings of gate lines and data lines, the method comprising:

applying a first data signal from a data driver, wherein the first data signal is formed from a substantially uniform current;

15 charging a first data signal controller circuit with a second data signal corresponding to the substantially uniform current in response to the outputted first data signal, wherein the first storage means is controllable by a first drive signal during application of a first scan signal;

20 charging a second data signal controller circuit with a third data signal corresponding to the substantially uniform current in response to the second data signal, wherein the second data signal controller circuit is controllable by a second drive signal between the application of the first scan signal and application of a second scan signal; and

applying the substantially uniform current to the data lines in response to the third data signal during application of the second scan signal.

25 17. The method of driving according to claim 16, wherein charging the first data signal controller circuit with the second data signal includes:

forming a current path between the data driver and the first data signal controller circuit in response to the first drive signal;

inputting the first data signal from the data driver through the current path; and

30 charging the first data signal controller circuit with the second data signal corresponding to the substantially uniform current of the inputted first data signal.

18. The method of driving according to claim 16, wherein charging the second data signal controller circuit with the third data signal includes:

forming a current path between the first data signal controller circuit and the second data signal controller circuit in response to the second drive signal;

inputting the second data signal corresponding to a voltage charged in the first data signal controller circuit; and

5 charging the second data signal controller circuit with the third data signal corresponding to the substantially uniform current of the inputted second data signal.

19. The method of driving according to claim 16, further comprising:

inputting the third data signal during application of the second scan signal ;

10 charging a storage capacitor in the OLED panel in accordance with the inputted third data signal and controlling a current path width of a switching device connected to an electro luminescence cell within the OLED; and

causing the electro luminescence cell to emit light in accordance with a voltage difference between a cell drive voltage source and a ground voltage source and in accordance
15 with the current path width.

20. The method of driving according to claim 16, wherein a current characteristic of the first and second data signals are different from a current characteristic of the third data signal.

21. A display device, comprising:

a data driver for outputting data signals;

a display panel comprising a substrate; and

a data signal controller circuit, for controlling the output data signals, the data signal
25 controller circuit being formed on the substrate and coupled between the data driver and the display panel.

22. The display device of claim 21, wherein the data signal controller circuit further comprises a first data signal controller circuit, a second data signal controller circuit
30 coupled to the first data signal controller circuit and the display panel.

23. The display device of claim 22, wherein the first data signal controller circuit is selectively connectable to the second data signal controller circuit.

24. The display device of claim 21, wherein the data signal controller circuit is selectively connectable to the display panel.

5 25. An organic electroluminescence display device, comprising:
a display panel;
a plurality of organic electroluminescent pixel elements within the display panel for expressing light, wherein luminosity values of the plurality of pixel elements across the display panel vary by less than about 30%.

10 26. The organic electroluminescence display device according to claim 25, comprising:

a data driver for outputting data signals; and
a data signal controller circuit, for controlling the output data signals, the data signal controller circuit being electrically coupled to the display panel and coupled between the data driver and the display panel.

20 27. The organic electroluminescence display device according to claim 26, wherein the data signal controller circuit further comprises a first data signal controller circuit and a second data signal controller circuit coupled to the first data signal controller circuit and the display panel.

25 28. The organic electroluminescence display device according to claim 27, wherein the first data signal controller circuit is selectively connectable to the second data signal controller circuit.

29. The organic electroluminescence display device according to claim 26, wherein the data signal controller circuit is selectively connectable to the display panel.

30 30. The organic electroluminescence display device according to claim 26, wherein the data signal controller circuit is formed on the display panel.

31. The organic electroluminescence display device according to claim 26,

wherein the data signal controller circuit is mounted directly on the display panel.

32. The organic electroluminescence display device according to claim 26, wherein the data signal controller circuit is attached to a side portion of the display panel.

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33. The organic electroluminescence display device according to claim 25, wherein luminosity values of the plurality of pixel elements across the display panel vary by about 5%.

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